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ABSTRACT

This guide provides summaries of federal programs in the biological sciences of interest to colleges and universities. Programs described fall within the following agencies: National Science Foundation, Public Health Service, Smithsonian Institution, Department of State, Department of Agriculture, Department of Commerce, Office of Education, Department of Energy, Environmental Protection Agency, and the Department of Transportation. Program information is provided for institutions and for individuals. (Author/MA)



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# A Guide to Federal Funding in the Biological Sciences

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# INTRODUCTION

This guide provides summaries of federal programs in the biological sciences of interest to colleges and universities. Programs covered fall within the following agencies: National Science Foundation, Public Health Service, Smithsonian Institution, Department of State, Department of Agriculture, Department of Commerce, Office of Education, Department of Energy, Environmental Protection Agency, and the Department of Transportation.

The numbers after program titles refer to the Catalog of Federal Domestic Assistance.

# A GUIDE TO FEDERAL FUNDING

# IN THE BIOLOGICAL SCIENCES

by

Myra Ficklen

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1818 R Street, N. W.
Washington, D. C. 20009
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PROGRAMS FOR INDIVIDUALS

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# NATIONAL SCIENCE FOUNDATION

## DIRECTORATE FOR SCIENCE EDUCATION

## DIVISION OF SCIENTIFIC PERSONNEL IMPROVEMENT (47.049)

SCIENCE FACULTY PROFESSIONAL DEVELOPMENT PROGRAM

- grants for full time college science teachers engaged primarily in undergraduate teaching. Awards are to increase competence in the professor's field by studying or working at another institution for three to twelve months. Projects may be carried out during three consecutive summers. NSF particularly encourages projects for college teachers to work in an industrial setting. Stipend support is based on salary and includes a travel allowance to and from the affiliate institution.

Applicants must submit an activities program indicating the plan of study. Applications are evaluated on 1) the potential of the activities program to contribute to the applicant's development as a science teacher; 2) evidence that the applicant can carry out the plan; 3) appropriateness of the proposed institution of affiliation and tenure period; and 4) evidence of past accomplishments as a science teacher. Deadline is usually December. NSF makes approximately 130 awards each year.

CHAUTAUQUA-TYPE SHORT COURSES

- support for short courses for college science faculty in a variety of topics at field centers throughout the U.S. NSF provides support for lodging, instructional materials, and partial travel costs. Each course meets for a total of four days - two in the fall and two in the spring. During the interim participants work on projects related to the course. Topics have included "Biological Roots of Adaptive Behavior and Intelligence", "Recombinant DNA: Social and Scientific Perspectives", and "Origins of Life."

AAAS administers the program for NSF. Announcements of course schedules are usually available in July or August, with selection of participants about two to four weeks prior to the beginning of the course.

GRADUATE FELLOWSHIPS

- fellowships of approximately $325 per month for the most talented scientists to pursue graduate training. Approximately 550 new awards and 1000 continuation awards are made each year. Applicants must, at the time of application, have not completed more than 18 quarter hours/12 semester hours of post-baccalaureate study. No student may receive more than three years of NSF graduate fellowship support.

NATO POSTDOCTORAL FELLOWSHIPS

- grants for full time postdoctoral study in a NATO country (excluding the U.S.) for periods of nine to twelve months. Applicants must have earned doctoral degrees (usually within the past five years) or have equivalent research training

or experience. Evaluation of the applicants is based on academic records, letters of recommendation, ability to carry out proposed research and other evidence of scientific competence. Consideration is also given to the applicant's competence in the language of the country in which he/she plans to study. NSF particularly encourages projects which contribute to international collaboration in science. NSF makes approximately 40 awards each year. The deadline is in November.

NATO ADVANCED STUDY INSTITUTES TRAVEL GRANTS

- grants to selected NATO advanced study institutes for use as travel grants for participating U.S. students. Institutes are generally held during the summer and are intended to provide advanced instruction on highly specialized topics in an environment which will promote international exchange and cooperation. Advanced graduate and postdoctoral students and junior-level faculty are eligible. Applicants must be nominated by the institute director. Announcement of the institutes is usually in February, but deadlines differ according to the institute. Approximately 70 students receive travel awards.

NATIONAL NEEDS POSTDOCTORAL FELLOWSHIPS

- grants to individuals who have received their doctorates within the past five years for research related to significant national needs. (Awards are not made in clinical, education or business fields, nor history, social work or public health.) Tenure of the award is generally six to nine months. Fellows are selected on the basis of academic records, letters of recommendation and other indications of scientific excellence. NSF makes approximately 100 awards per year. The deadline is in December.

PRE-COLLEGE TEACHER DEVELOPMENT IN SCIENCE

- grants to colleges and universities for workshops designed to improve elementary and secondary school teachers' knowledge of scientific subjects. Projects should be developed in close collaboration with teachers and other education personnel at the levels at which the project will focus. Projects may be academic-year workshops, with sessions held regularly during the academic year or summer seminars for full-time study over a one to four-week period. The maximum grant is $50,000. In the first year of the program NSF made 185 awards; expectations are to make 30-35 awards per year in future years. Deadline is usually November.

UNDERGRADUATE RESEARCH PARTICIPATION

- institutional grants to allow up to 12 undergraduate students to work full-time with faculty during the summer on a research project. Funds cover student stipends plus cost of operating the project. NSF emphasizes that a project should provide a complete research experience for the student, so he/she can have a sense of accomplishing a task. High priority is given to research projects dealing with environmental and societal issues. NSF makes about 200 awards each year. Deadline is in August.

SECONDARY SCHOOL STUDENT SCIENCE TRAINING

- grants to higher education institutions or other associations to provide high ability high school students with research experience or college level instruction. Approximately 125 grants are made for projects with some 4400 participants. Projects cover all fields; they should be designed to offer

guidance and encouragement to high school students with strong potential for scientific careers. Grants range from $4,000 to $20,000. Deadline is in September.

WOMEN IN SCIENCE

- grants to institutions for Science Career Workshops for Women at the freshman-sophomore; junior-senior; or graduate level and for women who have a bachelor's degree in science but are neither in graduate school nor employed in scientific jobs. Workshops should be multidisciplinary and provide candid information and guidance on careers and educational opportunities in sciences for women. Each workshop should accommodate 100 to 500 participants from a radius of 100 miles. The maximum grant from NSF is $10,000. NSF places considerable emphasis on evaluation plans and utilization of the results of the workshop. This program is still in experimental stages, so changes in guidelines may occur from year to year. NSF makes approximately 25 grants each year. The deadline is in December.

HANDICAPPED IN SCIENCE

- grants for conferences, workshops, studies and science training models to identify and seek solutions to the problems of the physically handicapped becoming scientists. Career guidance information, student science training projects, as well as needs assessments and surveys are funded. NSF makes approximately ten to twelve awards each year. The maximum grant is $50,000. Deadline is in November.

## DIVISION OF SCIENCE EDUCATION RESOURCES IMPROVEMENT (47.048)

COMPREHENSIVE ASSISTANCE TO UNDERGRADUATE SCIENCE EDUCATION (CAUSE)

- grants to two and four year colleges and universities to strengthen undergraduate science programs, improve the quality of teaching and help institutions enhance and evaluate science education programs. Projects may involve alternative teaching methods - including use of audio-visual equipment, computers, etc. as learning tools; remedial instruction; or other activities aimed at improving an instructional program. Proposals require a local review statement indicating how the proposed activities fit into the overall goals of the institution. The maximum grant is $250,000 over a three-year period, with a one-third cost sharing required. Funds may be used for salaries, equipment, minor renovation of facilities, faculty travel, indirect costs and other expense items attributable to the project. NSF makes 60-70 awards each year. Deadline is in December.

LOCAL COURSE IMPROVEMENT PROGRAM (LOCI)

- grants to colleges and universities to help restructure a course(s) or try out new scientific and educational techniques on a small scale. Much of the planning for the course can take place during the summer months. Projects should be designed to meet the local needs on a campus and need not be model projects. Grants range from $1400 to $25,000 with a one-third cost sharing required. NSF makes approximately 130 awards each year. Deadline is in October.

INSTRUCTIONAL SCIENTIFIC EQUIPMENT PROGRAM

- grants up to $20,000 which must be matched on a dollar for dollar basis, for purchase of equipment needed to improve instruction in the classroom.

Equipment purchase must be tied to course improvement. Institutions can submit from one to five proposals (based on FTE); NSF allows only one award per discipline every three years. Deadline is in March.

MINORITY INSTITUTIONS SCIENCE IMPROVEMENT PROGRAM (MISIP)

- grants to institutions which draw over 50% of their enrollments from ethnic minorities, to 1) improve the quality and preparation of their students for graduate work or careers in science; 2) increase the number of minority students with majors in science; and 3) improve the capability of minority institutions in the area of institutional planning and development, so that they can compete more effectively in assistance programs not specifically intended for minority groups. Three types of grants are available: design grants; grants to individual institutions for comprehensive science improvement; and grants to support a cooperative project among several institutions. Design grants provide up to $20,000 over a twelve-month period to help in development of long-range science improvement plans. Only institutions which do not have formal planning capabilities (PME systems, federal relations, institutional research or development offices) are eligible. Institutional and cooperative projects may request up to $300,000 for a three-year period to implement science improvement plans through a variety of activities including faculty development, advanced science seminars, faculty exchange, new curricula, etc. (Non-minority institutions can participate in cooperative projects.) The deadline is in March.

INFORMATION DISSEMINATION

- support for projects designed to assist school system representatives and others concerned with education at the pre-college level to learn about new and alternative instructional materials, classroom practices and recent science education research findings. Activities can include conferences, information exchange systems or other means of disseminating information. The maximum grant is $25,000. Deadline is in February.

EXPERIMENTAL PROJECTS FOR IMPROVEMENT OF SCIENCE EDUCATION RESOURCES

- grants for a limited number of projects which relate to the objectives of the division but do not fall into one of the established program areas. Eligible projects are those which seem likely to 1) provide an important source of information for potential new thrusts or improved effectiveness in one of the existing programs or 2) serve as an external indication for future new programs of the Science Education Directorate. Proposals are handled on a case by case basis.

## DIVISION OF SCIENCE EDUCATION DEVELOPMENT AND RESEARCH (47.048)

RESEARCH IN SCIENCE EDUCATION

- support for research in science education in all disciplines. Projects must be designed to generate new knowledge which will lead to more effective science education and better uses of educational resources. Current areas of interest include problems of motivation and learning in adolescents and developmental attitudes in science. Where possible NSF encourages collaboration between educational researchers and those with experience in science education. NSF makes approximately 20 awards each year. Deadline is in March.

DEVELOPMENT IN SCIENCE EDUCATION

- support for innovative methods and materials which can serve as models in science education. Projects should represent a significant departure from usual practices in science education and show promise of providing a practical, transferable product. Priority areas are determined each year. In FY 1978 awards are limited to on-going projects and selected projects in continuing education.

## DIVISION OF SCIENCE AND SOCIETY (47.038)

ETHICS AND VALUES IN SCIENCE AND TECHNOLOGY

- grants for projects, including research, workshops, conferences and other activities designed to increase understanding and interaction between the scientific and technological communities, other professional communities, and the general public in the following substantive categories: 1) value issues in the professional education and conduct of scientists and engineers; 2) value issues associated with technological innovation; and 3) value issues in institutional choices. Sharpness of focus on issues related to the ethical and social dimensions, relative social importance of the general area within which the project falls, originality and clarity of methods, evaluation in achieving specific goals are the major review criteria. Preliminary proposals are due in January, May and September, with full proposals due in April, August, and December.

SCIENCE FOR CITIZENS FORUMS, CONFERENCES AND WORKSHOP PROGRAM

- grants to citizen groups and other nonprofit organizations to bring together citizens and scientists to provide citizens with access to scientific expertise on science-related policy issues of interest to citizens. NSF is particularly eager to serve groups which do not normally have easy access to scientific expertise. Colleges and universities should work with such groups in developing proposals. The most successful proposals have been those which deal with specific problem areas, not vague general concepts such as "the energy problem." Preliminary proposals are due in March, full proposals in May. NSF awards approximately 20 grants each year.

PUBLIC SERVICE INTERNSHIPS AND RESIDENCIES

- grants to provide scientists and engineers an opportunity to work for up to one year in public service organizations or with citizen groups. Applicants must make arrangements with an appropriate host organization and propose a suitable activity. Proposals should emphasize the scientific, public service and outreach objectives of the program and indicate how the activity will contribute to the ongoing program of the host organization. NSF gives priority to applications in which the proposed activities are intended to reach groups that normally do not have access to scientific expertise and information.

Each year NSF awards 15 to 25 each of internships and residencies. An applicant for a residency must have earned a final postgraduate or professional degree or have acquired comparable experience in an eligible field. Applicants for internships must be enrolled in an appropriate undergraduate or graduate program and have completed at least three years of undergraduate study with a major in science or engineering. The deadline is usually in March.

PUBLIC UNDERSTANDING OF SCIENCE

- grants to direct projects to increase the general understanding of science

and technology and the effects of scientific methods and activities on our lives. Activities can include radio and television programs, newspaper and magazine presentations, museum and science center exhibits, drama and film presentations, and lectures, forums, conferences and workshops. In addition, projects to improve methods of communication with the public and studies of those methods of communications with the public are also funded. Projects should be transferable and applicable to a large group, be cost effective, reach audiences not effectively reached by existing informal education programs and utilize new modes of communication. Preliminary proposals may be submitted at any time. Staff attempts to respond within eight weeks. Closing dates for formal proposals are: April, August and December.

## DIRECTORATE FOR BIOLOGICAL, BEHAVIORAL AND SOCIAL SCIENCES (47.051)

BIOLOGICAL RESEARCH

- support for individual research projects to increase the store of knowledge in biological fields and to enhance understanding of problems facing the nation. Most of the research supported is basic in nature, though some work of an applied nature may be supported. Grants are normally for periods up to 24 months. NSF also provides limited support for research workshops, symposia, and conferences, the purchase of scientific equipment for research purposes, and limited travel to international meetings. Proposals may be submitted at any time. Approximately six to eight months should be allowed for consideration of a proposal. Following are program areas:

1. Physiology, Cellular and Molecular Biology - includes support for biochemistry, biophysics, developmental biology, regulatory biology, metabolic biology, genetic biology, human cell biology, and cell biology.
2. Environmental Biology - support for studies in ecology, ecosystems studies, systemic biology, population biology and physiological ecology.

Grants range from $200 to $250,000; the average grant is $51,400.

SMALL COLLEGE FACULTY ENGAGED IN RESEARCH AT LARGER INSTITUTIONS

- opportunities for faculty members at smaller institutions to participate in original and basic research being conducted at larger institutions through supplemental grants to project directors. There are no formal guidelines or application forms; the procedure is:

1. Faculty member locates a researcher in his field of interest who has an NSF grant.
2. Faculty member then contacts the researcher and persuades the latter to accept him as an associate for the agreed-upon period of time (summer, semester, etc.)
3. The researcher requests a supplemental grant to cover the budget changes.

There is no deadline, but arrangements take at least six months. Available funds vary with different divisions. NSF makes approximately 100 such grants each year.

RESEARCH INITIATION IN MINORITY INSTITUTIONS

- grants for up to 36 months with a maximum award of $35,000 for research projects at institutions whose enrollments are composed predominantly of ethnic minorities. The deadline is March.

INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH ACTIVITY

- grants to encourage cooperation between universities and industrial firms. Proposals must be prepared jointly by their respective institutions. Research should focus on fundamental scientific questions, rather than on technological development. Proposals are submitted to the directorate for Biological, Behavioral and Social Science, but identified as candidates for the industry/university cooperation. The most important criteria in evaluating proposals is scientific excellence. However, potential of the research to enhance cooperation between academic and industrial organizations will also be a factor.

## DIRECTORATE FOR ASTRONOMICAL, ATMOSPHERIC, EARTH AND OCEAN SCIENCES (47.050)

BIOLOGICAL OCEANOGRAPHY

- NSF supports a broad range of research efforts, primarily through small grants to highly qualified scientists and their graduate students. Included in this program are studies on effects of environmental and other factors on composition and rates of production of marine organic material; environmental adaptation of organisms inhabiting the deep sea, their role in modifying materials reaching the ocean floor, etc. Proposals may be submitted at any time, and usually require at least six months for review.

## DIVISION OF PROBLEM-FOCUSED RESEARCH APPLICATIONS (47.041)

(Replaces Research Applied to National Needs)

- support for research which is directed toward solving selected societal problems, using science and technology as working tools for problem solution; support for problem-focused research that bridges from basic research discoveries to application. One area of particular interest to biologists is:

Alternative Biological Sources of Materials - research in selected aspects of the problem of meeting the nation's future needs for raw materials. Areas currently designated as high priority include: biological conversion of lignocellulosic materials to useful chemicals: biological nitrogen fixation; and production of rubber from guayule plant.

Other areas of research include Chemical Threats to Man and the Environment; Community Water Management, Earthquake Hazards Mitigation.

SCIENTIFIC, TECHNOLOGICAL AND INTERNATIONAL AFFAIRS (47.053)

- support for programs with international dimensions in basic and applied research. Projects generally fall into one of the following areas:

1. Joint seminars or workshops - usually involve 20-25 experts to help design and develop joint research projects.
2. Cooperative research - U.S. scientists work with scientists of another country, with the two countries sharing costs. Proposals must be submitted to agencies in both countries simultaneously; both sides must approve the plan. Fundability often depends on the interest of the other country. Countries and areas with which the U.S. has formal agreements are: Australia; Republic of China; Romania; Hungary; Czechoslovakia; Bulgaria; France; India; Israel; USSR; Italy; Japan; Latin America; New Zealand. Agreements with each country vary as do research areas of interest.
3. Visiting scientists - payment of partial costs for scientists to go abroad to conduct research; visits can be short or last for a semester or year.
4. Special foreign currency program - support for scientists to carry out research in countries in which the U.S. owns excess currency (expected to be India, Pakistan and Egypt).
5. International travel program - grants for approximately 250 scientists to attend significant international meetings at which they are delivering papers.

Size of grants varies widely according to the project. Generally travel grants do not exceed $1,200. Proposals are accepted throughout the year in most categegories. NSF particularly encourages young investigators to work on cooperative research efforts.

SCIENTISTS AND ENGINEERS IN ECONOMIC DEVELOPMENT (SEED)

- grants for scientists or engineers to conduct research or teach in one of the 45 participating developing countries. Applicants must have at least five years of postdoctoral or equivalent experience in teaching or research and plan to return to his/her institution when the project is complete. Deadline is usually in December.

## PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

The National Institutes of Health provide grants for research projects, Research Career Development Awards and National Research Service Awards for research related to the health of the U.S. population. While NIH is mission-oriented much of the research is basic--molecular, cellular, animal studies, etc. Applications are submitted to a central clearinghouse and assigned to a particular

institute; project directors should talk with personnel at the appropriate institute which will request the proposal be assigned there. Size of research grants and contracts varies widely from $680 to over $2 million. National Research Service Awards provide a set stipend of $3,900 per annum for pre-doctoral stipends, to a range of $10,000-14,000 per annum for postdoctoral, with other allowable institutional costs. Research Career Development Awards provide assistance to institutions to help foster the early development of scientists with outstanding potential. The general priorities of the institutes are outlined in the following pages. Deadlines for grants are usually March, July, November; deadlines for National Research Service Awards are February, June, October.

NATIONAL INSTITUTE ON AGING (13.866)

- grants to support research related to the aging process and diseases and other special problems of the elderly. Approximately 80% of total NIA funding goes to projects concerned with the biology of aging. Much of this research is with laboratory animals, to study the biophysical, biochemical, cellular, organ or organismic aging. NIA also supports studies related to effects of nutrition on the aged and the effects of nutrition on the aging process. Grants average $85,000 per year; most awards are multi-year.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

- research support, primarily to large centers, with multifaceted, long-term research capabilities related to immunology and infectious diseases. Categories of support are:

1. Immunology, Allergic and Immunologic Diseases Research (13.855) - research efforts focus primarily on asthma and allergic diseases; clinical immunology and immunopathology; immunobiology and immunochemistry. Special programs have focused on evaluation of tissue matching for organ transplantation, and new procedures to promote acceptance of grafts. Approximately 530 grants are made each year.
2. Microbiology and Infectious Diseases Research (13.856) - research related to infectious diseases including hepatitis, sexually-transmitted diseases and research in disease control measures. Studies include origin and development of drug resistance in micro-organisms, biochemistry and genetics of plasmid-determined functions and selected aspects of recombinant DNA problems. Approximately 870 grants are made each year.

The U.S.-Japan Cooperative Medical Science program provides the opportunity for collaborative research efforts focusing on the specific diseases of cholera, leprosy, tuberculosis, parasitic diseases and certain aspects of environmental pollutants as a cause of cancer and cell changes.

NATIONAL CANCER INSTITUTE

The National Cancer Institute provides support for research for cancer-related activities in laboratory and clinical research, in cancer control, for cancer centers, construction, conferences and training. Most funds are for large-scale grants and contracts to highly specialized institutes and cancer research labs (often attached to a medical school). Little of this money supports small-scale research at undergraduate schools. National Research Service

Awards for research in Cancer Etiology and Prevention, Cancer Detection and Diagnosis, Cancer Treatment and Research are also available. Categories of support are outlined below:

1. Cancer Cause and Prevention (13.393) - support for research related to cancer including viral research; assessment of carcinogenic risk from environment; studies of dietary and nutritional determinants of cancer; and a smoking and health program. Much of this research is conducted in house. Grants average $68,155 per year for three to four years of funding.
2. Cancer Detection and Diagnosis Research (13.394) - support for research and development projects in areas related to cancer detection and diagnosis. Research related to early diagnostic methods is particularly encouraged. Grants average $72,000 per year for three to five years; size of contracts varies widely.
3. Cancer Treatment Research (13.395) - grants and contracts for research in the treatment and cure of cancer, including development and evaluation of drugs used singly and in combination with other drugs and other modalities of treatment. Studies in molecular biology and the development and use of biological markers to assess tumor status are major areas of research activity. Grants average $79,000 per year for three to four years; size of contracts varies widely.
4. Cancer Biology Research (13.396) - support for fundamental research related to the cause and nature of cancer in man. Current research includes studies to ascertain the role of specific cell components in such processes as virus infection, cellular aggregation, drug sensitivity, etc. Much of the research is carried out at the Frederick Cancer Research Center. Extramural grants range from $8,500 to $380,000.
5. Cancer Center Support (13.397) - grants for planning and establishing cancer centers for programs consistent with local needs and the National Cancer Plan. Centers must be allied with a medical-education or research institution and provide facilities for multidisciplinary research as well as community outreach to both the lay and professional population. One or two-year exploratory grants may also be made to determine the feasibility of a research center. Nineteen centers have been recognized as meeting the criteria; two or three additional sites will be reviewed. Size of grant varies widely.
6. Cancer Research Manpower (13.398) - support for institutions to provide biomedical training opportunities for individuals interested in careers in specified fields related to cancer. Approximately ten institutional awards and 100 individual awards are made in this category each year.
7. Cancer Control and Rehabilitation (13.399) - grants and contracts for support of cancer-related research. Projects currently being supported include community-based cancer control programs for a more coordinated approach to cancer control, multidisciplinary centers for diagnosis, treatment and rehabilitation and continuing care for cancer patients. NIH is particularly interested in dietary and nutritional management of cancer patients, development and evaluation of new biomaterials for better prosthesis construction; and management of pain in cancer patients.

NATIONAL EYE INSTITUTE

- conducts and supports research and training related to the prevention, etiology and pathogenesis, diagnosis and treatment of eye diseases and disorders of the visual system. Research may range from fundamental biological studies to the development and testing of a specific therapeutic technique. Research is divided into the following program areas:

1. Retinal and Choroidal Diseases Research (13.867) - support for research to obtain a better understanding of how the retina functions and to increase understanding, prevention, and treatment of diseases of the retina. Grants range from $3,000 to $300,000. Contracts average $100,000. NEI makes approximately 280 research grants and 71 NRS awards each year for retinal and choroidal diseases research.
2. Corneal Diseases Research (13.868) - support for research related to diagnosis, treatment, and prevention of corneal diseases, including studies on structure and function of the cornea, development and letting of new drugs for treatment. Grants range from $3,000 to $300,000; contracts average $100,000. Approximately 76 research grants and career awards and 43 NRS awards are made each year.
3. Cataract Research (13.869) - grants and contracts for research to help identify causes of cataracts and to develop methods for prevention and improved treatment of the disease. Current research includes biochemical and metabolic studies in lower mammals, and how normal lens transparency is maintained. Approximately 75 research grants and career awards and 12 NRS awards are made each year, ranging from $3,000 to $300,000.
4. Glaucoma Research (13.870) - support for research to determine cause of glaucoma, develop techniques for prevention and detection of glaucoma and improve methods of treatment. Research is currently centered on primary open-angle glaucoma and the mechanism by which introacular pressure is regulated. Approximately 100 research grants and career awards, 32 NRS awards and one to two contracts are awarded each year.
5. Sensory and Motor Disorders of Vision (13.871) - support for research on the optic nerve and the development and function of those activities of the brain and the eye muscles which make vision possible. Approximately 145 research grants and career awards and 16 NRS awards are made each year. Grants average $53,000.

NATIONAL INSTITUTE OF ARTHRITIS, METABOLISM AND INFECTIOUS DISEASES

- support for fundamental and clinical research related to a broad array of diseases that are characterized by chronicity and long-term disabling effects rather than mortality. Research responsibilities are distributed over the following program areas:

1. Arthritis, Bone and Skin Disease Research (13.846) - support for basic laboratory research and clinical investigations to provide new information in areas of arthritis, dermatology and orthopedics. Special emphasis has been placed on various arthritic diseases and rheumatic and connective tissue disorders. Approximately 120-130 awards and 35 NRS awards are made each year.

2. Diabetes, Endocrinology and Metabolism Research (13.847) - grants for fundamental and clinical research related to diabetes and other inherited errors of metabolism; endocrine disorders, and other related areas. Approximately 900 research awards and 95-125 National Research Service Awards are made each year.
3. Digestive Diseases and Nutrition Research (13.848) - support for laboratory research and clinical investigations related to digestive diseases and nutrition research. Current research activities include basic research related to gallstone formation, evaluation of human nutrition requirements, and research on gastrointestinal hemorrhage. Approximately 425 research awards and 62 NRSA are made each year.
4. Kidney Diseases, Urology and Hematology Research (13.849) - grants and contracts for research related to kidney diseases urology and hematology. Programs include studies on pathophysiology of uremia, blood access and clotting mechanisms, dialyzers and dialysate delivery systems, better methods for acid-base control, anemia, etc. High priority is better treatment of end-stage renal disease. Approximately 350 research grants and 100-150 NRSA are made each year.
5. U.S. Cooperative Medical Science Program - focuses on various aspects of human malnutrition important to the countries of Southeast Asia.

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

- support for research directed toward definition and explanation of toxicologic mechanisms and effects induced by environmental stressors as related to human health. The program is divided into the following areas:

1. Environmental Mutagenesis Reproductive Toxicology (13.873) - support for research related to the objectives of the institute: 1) to clarify the nature and structure-activity relations of chemicals in air, water, food and various risk environments capable of altering or adversely affecting human genetic make-up, reproductive capability, or the embryo or fetus; 2) to develop reliable test systems with unequivocal quantitative relevance to man for detection and quantification of mutations and teratological defects; and 3) to elucidate molecular and cellular mechanisms and reproductive anomalies. Approximately 50 grants and 18 contracts are awarded each year. Research grants range from $4,500 to $400,000; the average grant is $87,000.
2. Etiology of Environmental Diseases and Disorders Research (13.874) - research related to the identity and understanding of the causal associations between hazardous chemical, physical and biological factors in man's environment and human morbidity and mortality. Special areas of interest include health research related to energy development and conservation, factors such as pesticides, food additives, solvent, light, temperature, noise, etc. on health. Approximately 85-90 grants and 4-5 contracts are awarded each year. Grants range from $4,500 to $400,000; the average grant is $87,000.
3. Environmental Pharmacology and Toxicology Research (13.875) - support for research focusing on the process by which environmental agents affect biological systems and by which biological

systems influence the action and fate of debilitating agents. Systems of concern can be organized at the molecular, subcellular, cellular, tissue organ, organismic and population levels. Grants range from $4,500 to $400,000; the average grant is $87,000. Approximately 140 grants and 14 contracts are awarded each year.

4. Environmental Pathogenesis Research (13.876) - support for research dealing with molecular, structural and functional changes that eventually result in morbidity or mortality. Research foci include studies on selection and validation of animal species more representative of man for specific disorders; development of better test methods for evaluating the extent of pathology at specific sites. Approximately 40 grants and 5 contracts are awarded each year. Grants range from $4,500 to $400,000.
5. Environmental Health Centers (13.872) - support for interdisciplinary centers at universities selected for their ability to attract and train gifted students in environmental health and related sciences. Seven centers are currently being supported.

NATIONAL INSTITUTE OF DENTAL RESEARCH

- support for research related to the cause, prevention and methods of diagnosis and treatment of dental diseases and conditions. Program includes research in such varied areas as developmental biology, genetics, microbiology, virology and materials science. NIDR is divided into the following program areas:

1. Caries Research (13.840) - support for research and development aimed at reducing the incidence of dental caries. Program focuses on development of agents that initiate the microbial process of caries, that increase the resistance of the tooth, or that decrease the potential of the diet to support caries. Grants range from $5,000 to $300,000; the average is $50,000. Approximately 95 research grants, 11 NRSA, and 43 contracts are made each year.
2. Periodontal Diseases Research (13.841) - support for research relating to the etiology, pathogenesis, diagnosis, treatment and prevention of periodontal disease, orofacial ulcerative disorders, oral neoplastic diseases, salivary gland diseases and tumors, and disorders of the dental pulp. Studies include the identification of bacteria that form periodontal plaque, the biochemical basis of adhesion, the nature of microbial enzymatic, immunologic and chemical activities that may cause disease. Approximately 105 research grants ranging from $5,000 to $300,000, 14 NRSA awards and 8 contracts are awarded each year.
3. Craniofacial Anomalies Program (13.842) - support of research aimed at prevention and control of craniofacial anomalies, with emphasis on greater understanding of the growth and development process. Approximately 100 research grants are supported each year, ranging from $5,000 to $300,000, with 12-15 NRS awards and 8 contracts.
4. Restorative Materials Research (13.843) - support for research in physical and biological sciences aimed at development of

new and improved materials to repair damaged oral tissues, to restore function and appearance and to prevent oral disease. Approximately 45 research grants ranging from $5,000 to $300,000 and 5 NRS awards are made each year.

5. Pain Control and Behavioral Studies (13.844) - support for basic and applied studies in various disciplines related to pain and discomfort associated with dental problems and their treatment. Approximately 22 research grants are made each year.
6. Dental Research Institutes (13.845) - support for five university-based dental institutes and centers for programs which build on existing research strengths in various aspects of dental research.
7. Soft Tissue Stomatology and Nutrition Research (13.878) - support for research which may lead to improvement and/or prevention of oral soft tissue diseases and conditions; research on effects of nutrition on the oralfacial complex; research into other physiology, metabolism and morphology of the mineralization process. Approximately 40 research grants and 10 NRS awards are made each year.

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT

- support for studies related to the sequential changes characteristic of individual development, from fertilization through maturation. The Institute focuses on research to 1) understand the reproductive process, including development and evaluation of contraceptives and the behavioral and social aspects of population problems; 2) realize the maximum health and well-being for every pregnant woman and her progeny; 3) define the prerequisites for the optimal human development from infancy through childhood and adolescence to adulthood; 4) prevent, detect and treat mental retardation and improve the intellectual capacity of normal and retarded individuals. Programs are divided as follows:

1. Center for Population Research (13.864) - support for biomedical research and development, including fundamental biological investigations and studies of contraceptive development and evaluation. All aspects of human and relevant animal reproductive processes in both the female and male fall within program guidelines. Other research includes studies of how sperm mature and acquire capacity to fertilize ova, studies of hormones involved in reproduction, etc. Approximately 590 grants and 100 contracts are awarded each year. Grants range from $1,200 to $750,000.
2. Center for Research for Mothers and Children (13.865) - support for research related to health of mothers and children. The Center is organized into the following program areas: Perinatal Biology and Infant Mortality; Growth and Development Program; Mental Retardation Program. Fundamental research includes studies of developmental biology, molecular and cellular aspects of development, physiological and metabolic studies of growth. Approximately 1000 grants and 40 contracts are awarded each year. Grants average $65,000; contracts average $90,000.

NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES

- support for research or training in the basic or general biomedical sciences which have significance for two or more NIH institutes or are outside the general area of responsibility of any other institute. Institute activities are organized through the following programs:

1. Cellular and Molecular Basis of Disease Research (13.862) - support for research concerning the biophysical and biochemical description and analysis of molecular events in normal and diseased cells, and the structure and function of cell organelles and membrane processes at molecular and subcellular levels. Grants range from $3,900 to $1 million. Approximately 995-1000 grants are awarded each year.
2. Genetics Research (13.862) - support for research which may lead to a better understanding of the fundamental processes and mechanisms of inheritance in health and disease. Research ranges from studies on nucleic acid chemistry to population genetics. Approximately 865 research grants are made each year, ranging from $3,900 to $1 million.
3. Pharmacology-Toxicology Program (13.859) - research related to all aspects of therapeutic drugs. The program encompasses a wide range of activities including synthesis of new drugs, basic studies in molecular and cellular mechanisms of action, clinical studies in man. Increasing emphasis is being placed on clinical pharmacology and development of new methodology and analytical techniques. Approximately 350 grants are made each year.
4. Clinical and Physiological Sciences Program (13.861) - support for research relating to trauma and burn and anesthesiology. Program focus includes biochemical and physiological changes induced by trauma and the fundamental aspects of wound healing and biological repair. Approximately 210 research grants are awarded each year.
5. Biomedical Engineering Research (13.860) - support for application of engineering knowledge to problems in fundamental and applied biomedical research, including development of new instruments and devices useful in medicine and health services delivery. More basic research focuses on exploration of life processes at molecular levels. Approximately 166 research grants, training grants and fellowships are awarded each year, ranging from $3,900 to $1 million.
6. Minority Access to Research Career (MARC) Program (13.880) - support for minority institutions to train greater numbers of scientists and teachers in the biomedical disciplines. Program categories are:
    a. MARC Faculty Fellowships - provide opportunities for advanced research training for selected faculty members of four-year colleges, universities and health professional schools in which enrollments are drawn substantially from ethnic minority groups. Awards are made for one to three years in support of advanced study and research in graduate departments and laboratories, either as candidates for the Ph.D. or in post-doctoral research training.
    b. Visiting Scientists - support for minority institutions to employ outstanding scientist-teachers to serve in capacity of visiting scientists at minority institutions for periods of one academic quarter to one year. Individuals nominated as visiting scientists should be recognized scientist-scholars in biomedical science. Stipends are determined on an individual basis.

c. MARC Honors Undergraduate Research Training Program - support to minority institutions for up to five years, to improve research training capabilities. Honors programs are for third and fourth year students. Funds may be used for research equipment and supplies essential to the program, and for stipends, tuition, fees and limited travel costs for the trainees.

NATIONAL HEART AND LUNG INSTITUTE

- support for research relating to the causes, prevention, diagnosis and treatment of heart, blood vessel, lung and blood diseases. Intramural and extramural research, training grants, and RFP's in special areas are supported.

1. Blood Diseases and Resources Research (13.839) - research related to blood diseases, particularly hemophilias, thromboembolic embolism, sickle cell disease, and other related disorders; and blood resources, including blood component therapy, blood safety, and transplantation biology. Approximately 425 research grants are made each year.
2. Lung Diseases Research (13.838) - grants to schools of medicine or osteopathy for research or research training in the respiratory field. Approximately 110 grants, and 35-40 contracts are made each year.
3. Heart and Vascular Diseases Research (13.837) - support for research related to heart and vascular diseases. Special emphasis programs include high blood pressure education, ischenic heart disease and artificial heart and cardiovascular devices. Approximately 1,225 research grants, 300 NRSA and 270 contracts are awarded each year.

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

- research, including fundamental investigations, related to improved diagnosis treatment and prevention of disorders of the nervous system.

1. Communicative Disorders Research (13.851) - support for research in all aspects of speech, hearing, equilibrium and the special senses, including anatomical, physiological, biochemical, behavioral and pathological studies. Approximately 185-200 research grants and 60 fellowships are made each year.
2. Stroke, Nervous System and Trauma Research (13.853) - research in three major areas: stroke, head injury, spinal cord injury; and two additional areas: growth and regeneration, and neoplastic disorders. Particular attention is being given to problems of formation of functional synapses by regenerating cells. Approximately 150 research grants and 5-7 contracts are awarded each year.
3. Neurological Disorders (13.852) - research principally in areas related to cerebral palsy, genetic disorders, epilepsy multiple sclerosis, parkinsonism and muscular dystrophy. Approximately 350 research grants, 240 fellowships and 20 contracts are awarded each year.
4. Fundamental Neurosciences Research (13.854) - support for studies related to nerve structure and function and the basic

disciplines (neuroanatomy, neurobiology, etc.). Approximately 250 research grants, 28 fellowships and 12 contracts are awarded each year. Research grants range from $38,000 to $377,000.

DIVISION OF RESEARCH RESOURCES

1. Laboratory Animal and Primate Research (13.306) - grants to help research institutions meet their need for higher quality specialized research animals, improved care of animals and better definition of animals as biomedical models. Support is provided to approximately 17 Centers and 60 research projects.
2. Biotechnical Resources Program (13.371) - support for developing and maintaining sophisticated tools for research, education and patient care. Awards are for large-scale resources, such as computer centers to serve investigators of an entire region. Approximately 45-50 awards, averaging $234,000, are made each year.
3. Biomedical Research Support (13.337) - support to complement other PHS research grants and strengthen research efforts. Institutions must have received at least $200,000 within the previous twelve-month cycle. Funds may support pilot projects; initial investigations in new fields and in fields new to the investigator; or other related research. Grants range from $15,658 to $262,000. Approximately 462 grants are made each year.
4. Biomedical Research Development Grant (13.337) - grants to help establish significant involvement in biomedical and/or health-related research in institutions which have small overall research programs. Only 12 to 15 awards are made each year. Applications may request up to three years of support; average funding is $100,000 per year. Eligible institutions cannot have received more than $200,000 in PHS grants during the previous 12 months. Deadline is October.
5. Minority Biomedical Support (13.337) - grants to strengthen institutional research capability of colleges and universities whose enrollments are drawn principally from ethnic minority groups. Both two-year and four-year institutions are eligible, including institutions which do not have significant involvement in biomedical research, but have the potential on which to build biomedical research and training. Funds may be used for faculty release time; stipends to graduate and undergraduate students to engage in research; purchase of equipment and supplies; renovation of research facilities; consultants. Grants range from $50,000 to $300,000 per year for three to five years. Approximately 75 institutional awards are made each year.
6. Clinical Research Centers (13.333) - grants and contracts to institutions with research capabilities to carry out studies in any preclinical or clinical science. Centers must be discrete, multidepartmental, multicategorical facilities for controlled investigations and analyses. Funds may be used for renovation of facilities, equipment, salaries and other laboratory costs. There are approximately 87 centers supported for the study of human disease and therapy.

MEDICAL LIBRARY ASSISTANCE (13.879)

- grants for improvement of access and better utilization of health information. Categories of support include:

1. Research Development and Demonstration - support for basic research, technical development and demonstration of projects in information science and services, health library science, health education, and history of medicine.
2. Special Scientific Projects - grants to eminent health scientists for developing major scholarly works which interpret or synthesize broad topics of health interest.
3. Training in Computer Technology - training grants to institutions to introduce clinical educators to computer technology.
4. Medical Library Resources - grants to medical libraries for improvement, expansion or development of information services.
5. Biomedical Publications - grants to nonprofit biomedical scientific publications for compilation, writing and editing of secondary information tools such as reviews, abstracts, translations, indices, handbooks, bibliographies, etc.

FOGARTY INTERNATIONAL CENTER FOR ADVANCED STUDY IN HEALTH SCIENCES

- fellowships are available in the following categories:

1. Fogarty Scholars-in-Residence Program - invitations to eminent biomedical professionals to spend from three to twelve months in residence at the NIH.
2. The Senior International Fellowship Program - opportunities to outstanding faculty members at mid-career from U.S. schools of medicine to go abroad to study and share expertise. Individuals must hold a full-time appointment on the staff of the nominating institution, have at least five years' experience beyond the doctorate or professional medical degree in research, teaching or other relevant professional work. Stipends are determined on an individual basis.
3. International Fellowship Program - fellowships to outstanding and relatively young biomedical scientists (within ten years of their doctorate) from 34 participating foreign countries. Each year approximately 75 new awards are made for individuals to work in U.S. laboratories.

EXTRAMURAL ASSOCIATES PROGRAM

- provides opportunities under the Intergovernmental Personnel Act for administrators involved with science, from schools which contribute significantly to the pool of minorities and women in science, to spend up to one year in residence at NIH. Associates work in rotating assignments in NIH, attend seminars and workshops, and make site visits to institutions with biomedical research programs. NIH expects the associates will gain a more comprehensive knowledge of federal funding opportunities, minority and women's programs, the peer review system, and the operations of Congress and the Executive Branch of the Federal Government as related to biomedical issues. NIH plans to make eight awards each year. Deadline is in January.

# PUBLIC HEALTH SERVICE - OTHER

## ALCOHOL, DRUG ABUSE AND MENTAL HEALTH ADMINISTRATION

### NATIONAL INSTITUTE OF MENTAL HEALTH

- support for research projects and training of investigators primarily in the following biological sciences: behavioral genetics, biological anthropology, neurobehavioral sciences, psycho-neuropharmacology, and ethology.

MENTAL HEALTH RESEARCH GRANTS (13.242)

- grants for basic and applied research investigations and studies related to mental health. Current biological research is on genetic, biochemical, neurophysiological factors in the etiology and processes of mental disorder and psychiatric syndromes. Basic research related to personality and cognition, neuropsychology, neuropsychology is supported. Grants average $49,000. Deadlines are October, February, June.

Small Grants - awards of up to $5,000 in direct costs for young investigators to carry out research in areas of interest to NIMH. This program is well-suited to investigators in smaller institutions and others who do not have regular research support or resources for exploration available. Small grant applications may be submitted at any time. Applications for summer support must be received by mid-January.

MENTAL HEALTH RESEARCH DEVELOPMENT AWARDS (13.281)

- support for young investigators with research potential to develop their skills through experience in a research environment. Awards are made to institutions with programs in mental health fields. Approximately 115-125 awards are made each year. Deadlines are October, February and June.

MENTAL HEALTH NATIONAL RESEARCH SERVICE AWARDS FOR RESEARCH TRAINING (13.282)

- individual National Research Service awards for postdoctoral and limited predoctoral research training in mental health related areas and institutional awards to help institutions develop research training opportunities for individuals interested in specified mental health fields. Current areas of interest include behavioral genetics, psychobiological aspects of maturation, sensory and motor processes, biological bases of social behavior. Proposals in such areas as development of the brain and central nervous system, at all levels of organization, are also encouraged. Applicants must be nominated and sponsored by an institution with staff and facilities suitable for the research. Staff encourages consultation before submission of a proposal. Predoctoral stipends average $3,900; postdoctoral stipends range from $10,000 to $14,000. Approximately 275-300 individual awards and 200-225 institutional awards are made each year. The deadline for institutional awards is October; for individual awards the deadlines are October, February and June.

### NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM

ALCOHOL RESEARCH DEVELOPMENT AWARDS (13.271)

- support for individuals at a sponsoring institution for research in

prevention, treatment,causes, and rehabilitation associated with alcohol abuse. Awards are for young investigators with research potential who need additional research training. Relevant areas include psychiatry, genetics, and clinical medicine. An investigator may receive up to five years of support. Approximately 15 awards are made each year. Deadlines are February, June and October.

ALCOHOL NATIONAL RESEARCH SERVICE AWARDS FOR RESEARCH TRAINING (13.272)

- grants for individuals for predoctoral and postdoctoral training related to alcohol abuse and for institutions to develop research training opportunities in specialized fields relating to alcohol abuse. Predoctoral stipends are $3,900; postdoctoral range from $10,000 to $14,000. Deadlines are February, June, October.

ALCOHOL RESEARCH PROGRAMS (13.273)

- support for research to develop new knowledge and approaches to problems and treatment of alcohol abuse. Both large-scale and small grants (up to $5,000 for young investigators) are available. Activities can include research projects, workshops, pilot studies, etc. related to alcohol abuse and prevention. Approximately 125 grants are made each year. Deadlines for research grants are February, June and October. Small grant applications can be submitted at any time, but must be received by mid-January for summer support.

## NATIONAL INSTITUTE ON DRUG ABUSE

DRUG ABUSE RESEARCH DEVELOPMENT AWARDS (13.277)

- support for individuals with strong research potential who need experience in a productive research environment. Research must be related to problems of drug abuse and narcotic addiction. Relevant fields in biomedical sciences include immunopharmacology, molecular pharmacology, neuropharmocology, as well as the neurobehavioral sciences. Grants are made to the institution on behalf of the individual. Approximately 15-20 awards are made each year.

DRUG ABUSE NATIONAL RESEARCH SERVICE AWARDS FOR RESEARCH TRAINING (13.278)

- individual awards for postdoctoral and limited predoctoral research training in specified drug-related areas and institutional awards to enable institutions to develop research training opportunities. Approximately 50 fellowships are awarded each year; stipends range from $10,000 to $14,000. Deadline for institutional grants is October. Deadlines for individual awards are October, February and June.

DRUG ABUSE RESEARCH PROGRAMS (13.279)

- support for research to develop new knowledge and approaches to narcotic addiction and drug abuse. Both large-scale and small grants (up to $5,000 for young investigators) are available. Activities can include workshops, pilot studies, and projects related to priority areas of drug abuse and prevention. Deadlines for grants are February, June, October. Small grant applications can be submitted at any time, but must be received by January for summer support.

## FOOD AND DRUG ADMINISTRATION

RESEARCH GRANTS (13.103)

-grants to support research activities concerned with food, food additives, shellfish sanitation, poison control, drug and cosmetic hazards, human and veterinary drugs, medical devices and diagnostic products, biologics and radiation emanating devices and materials. Approximately 30 projects are funded each year. Grants range from $5,000 to $125,000; the average grant is $40,000. Deadlines are March, July and November.

## OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

RESEARCH GRANTS (13.262)

-grants for research in areas related to occupational health, including environmental, technical and other factors. Grants average $50,000. Approximately 35-45 grants are awarded each year. Deadlines are October, February and June.

# SMITHSONIAN INSTITUTION

SMITHSONIAN INSTITUTION PROGRAMS IN BASIC RESEARCH AND PUBLIC EDUCATION (60.001)

- use of property, facilities, equipment, services, technical assistance in the many areas of Smithsonian expertise, including natural sciences. Libraries contain important collections and documents available for use by qualified researchers.

SMITHSONIAN HIGHER EDUCATION AND RESEARCH TRAINING PROGRAMS (60.002)

- fellowships for investigators who seek training in research supplementary to their disciplinary studies, to work with the staff of the Smithsonian. Applicants must indicate why the Smithsonian is the best place to carry out the proposed research in Natural Sciences, History of Science and other areas in which the Smithsonian has expertise. There are three levels of fellowships:

1. Postdoctoral Fellowships - stipends of $12,000 per year, for a six to twelve month tenure, to postdoctoral scientists and scholars within five years of their Ph.D. Approximately 20 awards are made each year. Deadline is in January for appointments beginning in September.
2. Predoctoral Fellowships - stipends of $7,000 per year to investigators engaged in dissertation research. Approximately 25 awards are made each year. Deadline is September.
3. Graduate and Undergraduate Fellowships - stipends of $1,000 for a ten week appointment at the Smithsonian. About 14 awards are made each year. The deadline is March.

Short-term visits for students and scholars seeking access to the Smithsonian facilities and staff can be arranged.

CHESAPEAKE BAY CENTER FOR ENVIRONMENTAL STUDIES (60.004)

- use of Center and facilities for predoctoral and postdoctoral researchers, visiting scientists and qualified groups who are pursuing specific studies or educational programs. Research can include basic studies in ecosystem processes, nutrient cycling, marsh productivity, estuarine modeling, small mammal population dynamics, etc. Education programs are oriented toward development of learning strategies and methods for environmental education purposes. Educational programs are open to children and adult groups on an appointment basis. Inquiries can be made at any time.

SMITHSONIAN SCIENCE INFORMATION EXCHANGE (60.009)

- serves as a clearinghouse of ongoing research supported by government and non-government agencies. Total annual collection of research records varies from 110,000 to 125,000. Each record includes the name of the supporting agency, names of principal and associate investigators, location of work, level of effort, dates of active work, and short description of the work. Indices and cross-references are maintained in order to answer a variety of questions. Fee schedules are available.

SMITHSONIAN SPECIAL FOREIGN CURRENCY PROGRAM (60.016)

- grants to higher education institutions for research in systematic and environmental biology, and atmospheric and earth sciences, archeology and other areas. Cost of research must be met with foreign currencies expended in the country where research is being carried out. Funds may be used for travel costs, salaries, food, lodging, etc. Collaborative efforts between an American institution and an institution in the host country are eligible. Most grants are within the $10,000 to $50,000 range. Approximately 42 projects are supported each year. Deadline is November.

SMITHSONIAN TROPICAL RESEARCH INSTITUTE (60.018)

- facilities for research in Panama. Institute includes marine research stations to provide comparative studies of flora and fauna of both Eastern Pacific and Caribbean Sea; a comprehensive library; a biological preserve on Borro Colorado Island, for research on tropical biology and the tropical environment. Advanced students at all levels and other scientists can apply to use the Institute. Inquiries can be made throughout the year.

## DEPARTMENT OF STATE

FULBRIGHT-HAYS EDUCATION EXCHANGE-UNIVERSITY LECTURERS (PROFESSORS) AND RESEARCH SCHOLARS (19.102)

- grants for research or lectureships for up to one year in a foreign country. Grants usually provide round-trip transportation, maintenance allowance which varies with each country, and a small incidental allowance. Lecturers must have college or university teaching experience; researchers must have a doctorate or recognized professional standing. Competitiveness varies with country and discipline. Approximately 450 awards are made for lectureships and 140 for research each year. Deadline is June for Australia, New Zealand and American Republics and July for Africa, Asia and Europe.

FULBRIGHT-HAYS PROGRAM FOR SCHOLARS ABROAD

- grants to colleges and universities for travel of foreign scholars to spend three to twelve months for lecturing or in research at the host institution. Council for International Exchange of Scholars administers the program. The host institution is responsible for maintenance. Approximately 500 scholars in a wide range of disciplines from abroad come to the U.S. under this program each year. Deadlines are in October for the following academic year.

Foreign scholars visiting the U.S. are often available to give lectures at other institutions in the U.S. The Council publishes a directory of visiting scholars and will help arrange such short-term visits.

AGENCY FOR INTERNATIONAL DEVELOPMENT INTERN PROGRAM

- two year training program which leads to positions in developing countries of Asia, Africa, Latin America and the Near East. Positions include agriculturalists, nutritionists, and other areas. Training in Washington lasts approximately six months with the remainder of the 24 months spent on overseas duty applicants should hold advanced degrees in the appropriate field. Most positions require language proficiency in French or Spanish. Interdisciplinary backgrounds with science, business or economics are helpful. Deadline is usually in November of the year preceding the Fall appointment.

TECHNOLOGY APPLICATIONS FOR LESS-DEVELOPED COUNTRIES (19.007)

- contracts to higher education institutions for research in developmental problems in areas such as agriculture, nutrition and other areas to make foreign assistance programs more effective. Size of awards varies from $5,000 to over $1 million. Research projects are generally carried out at large research institutions.

INSTITUTIONAL CENTERS TO AID FOREIGN DEVELOPMENT (19.006)

- grants to institutions to strengthen programs which can contribute to AID program in long-range economic and social developments in developing countries. Grants are to augment an on-going program at an institution by building upon existing skills and knowledge, not to develop new capabilities. Agriculture, nutrition, economics and other social science areas are included. There are no formal guidelines; an institution should outline its plan in a preliminary proposal to the agency. The largest portion of funding is awarded for activities in the area of food and nutrition. Grants average $500,000 and are made for periods up to five years.

## DEPARTMENT OF AGRICULTURE

GRANTS FOR SCIENTIFIC RESEARCH (10.200)

- grants for basic and applied research in high priority areas of a regional or national scope. Current priority areas include pest management, soybean research and genetic vulnerability. Most awards go to agricultural schools with well-developed research capabilities. Grants range from $19,437 to $499,463.

SCIENCE AND EDUCATION ADMINISTRATION - PLANT BIOLOGY AND HUMAN NUTRITION RESEARCH

- basic research in four areas of plant biology (biological nitrogen

fixation, biological stress on plants, photosynthesis and genetic mechanisms of crop improvement) and human nutrition. Approximately $5 million is earmarked for human nutrition research and $10 million for plant biology. Deadline is in April.

FORESTRY RESEARCH (10.651)

- support for research projects in the fields of timber management, watershed management, forest range management, wildlife habitat management, forest recreation, forest engineering and other related areas. Grants range from $2,000 to $100,000; the average grant is $20,000. Approximately 75 grants are made each year.

## DEPARTMENT OF COMMERCE

THE NATIONAL SEA GRANT PROGRAM (11.417)

- support for research, education and training in fields of marine science, engineering and related disciplines. The program is organized around the following categories of support:

1. Sea Grant Research - support for basic and applied studies in areas falling within the scope of the Sea Grant Program. Research should be justified in terms of ultimate utility to the program, but can be fundamental in nature.
2. Sea Grant Education and Training - limited support for educational and training activities, usually in applied areas rather than basic sciences, at the graduate level and limited support in ocean engineering at the undergraduate level. Proposals for new, innovative or experimental courses in areas related to the Sea Grant Program are also funded.
3. Sea Grant Programs - the following categories of support are available for the conduct of Sea Grant Activity:
    a. Institutional Support - awards to institutions or consortia which have an existing competence in marine affairs to improve programs. To qualify, an institution must make a long-range commitment to the Sea Grant objectives, including allocation of resources, establishment of interdisciplinary research teams and other activities designed to serve the state or region in marine affairs through an interdisciplinary program. Several universities and colleges, including two-year institutions, can work together to achieve a comprehensive program. Institutional support is provided with expectation of renewal, assuming quality performance in the program.
    b. Sea Grant Colleges - Sea Grant colleges are designated from among institutions of higher education receiving institutional support. Sea Grant colleges receive priority in funding support. Such designation is based on quality, quantity and productivity in areas

of research, education and advisory services; and the efficiency and completeness of the program for at least three years under Institutional Support. Most funds are committed to Sea Grant colleges.

c. Project Support - support for a clearly defined project to achieve a specified goal in research or education or in advisory services related to marine resources. Most projects should be completed within two years. Most institutions which later qualify for institutional support, have first completed successfully a Sea Grant Project.

d. Coherent Project Support - very limited support for longer-range projects in the following categories:

   1. Support to institutions which have strong core capability in marine affairs but which do not at present qualify for Institutional Support. Funding would enable the institution to improve its capabilities to better solve local or regional problems.
   2. Support to qualified institutions which have a rare or unique capability in a specialized field of marine affairs.

Coherent projects are very limited in number and staff encourages consultation before development of a proposal. Grants range from $25,000 to $2 million; the average grant is $318,000. Proposals are accepted through the year.

## OFFICE OF EDUCATION

ENVIRONMENTAL EDUCATION (13.522)

- support for development of innovative instructional materials and approaches for use in schools and communities, for training professionals in environmental education and for development of resource materials on specific environmental problems. Activities can include planning outdoor ecological study centers, preparation and distribution of materials for mass media and preservice and in-service training. Grants average $35,000. Mini-grants of $10,000 are available for workshops to assist communities in understanding local environmental problems. Approximately 90 awards are made each year, of which about 25 are to higher education insitutions. Deadline is in January.

## DEPARTMENT OF ENERGY

RESEARCH AND DEVELOPMENT IN NUCLEAR, SOLAR, GEOTHERMAL AND ADVANCED ENERGY SYSTEMS, AND PHYSICAL, BIOMEDICAL AND ENVIRONMENTAL SCIENCES (24.024)

- support for basic and applied research and development and demonstration

undertaken to discover new knowledge in fields related to energy. Support is provided in a wide range of fields including biomedical, medical and environmental sciences; environmental control technology; and other energy-related areas. Proposals are judged on their scientific merit, relevance to energy research and development and possible contribution to knowledge; credentials and experience of the investigator; facilities to carry out the proposed research. Size of grants varies widely. Proposals are accepted throughout the year.

## ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENTAL PROTECTION - CONSOLIDATED RESEARCH GRANTS (66.500)
- support for research for development of better systems for environmental management, including energy-related areas and pollution control. Grants range from $5,700 to $243,000. Approximately 190 grants are made each year. Applications are accepted throughout the year.

WATER POLLUTION CONTROL - RESEARCH DEVELOPMENT AND DEMONSTRATION (66.505)
- support for research and development and demonstration projects relating to the causes, effects, extent, prevention and elimination of water pollution. Staff advises consultation before submission of a proposal. Awards range from $13,000 to $125,000; the average grant is $75,000. Approximately 120 grants are made each year. Applications can be made at any time.

SAFE DRINKING WATER RESEARCH AND DEMONSTRATION GRANTS (66.506)
- support for research related to causes, diagnosis, treatment and other impairments of man resulting from unsafe drinking water. Also support for projects to demonstrate new water purification techniques or to demonstrate reuse of water. Grants range from $14,220 to $782,504. The average grant is $80,000. Approximately 80 awards are made each year. Applications may be submitted at any time.

## DEPARTMENT OF TRANSPORTATION

COAST GUARD COOPERATIVE MARINE SCIENCES PROGRAM (20.002)
- use of property, facilities and equipment of Coast Guard for cooperative efforts in research in marine sciences by researchers and students. Use of property depends on availability of suitable equipment and the pertinence of the project to national program. Inquiries may be made throughout the year.

Related publications of the Federal Resources Advisory Service include:

Federal Grants: A Basic Handbook
A Directory of Selected Federal Program Offices
A Guide to Federal Funding in the Arts and Humanities
A Guide to Federal Funding in the Social Sciences
A Guide to Federal Funding in the Physical and Mathematical Sciences
A Guide to Federal Funding for Education, Libraries and Other Institutional Programs
A Guide to Federal Funding for Health Programs